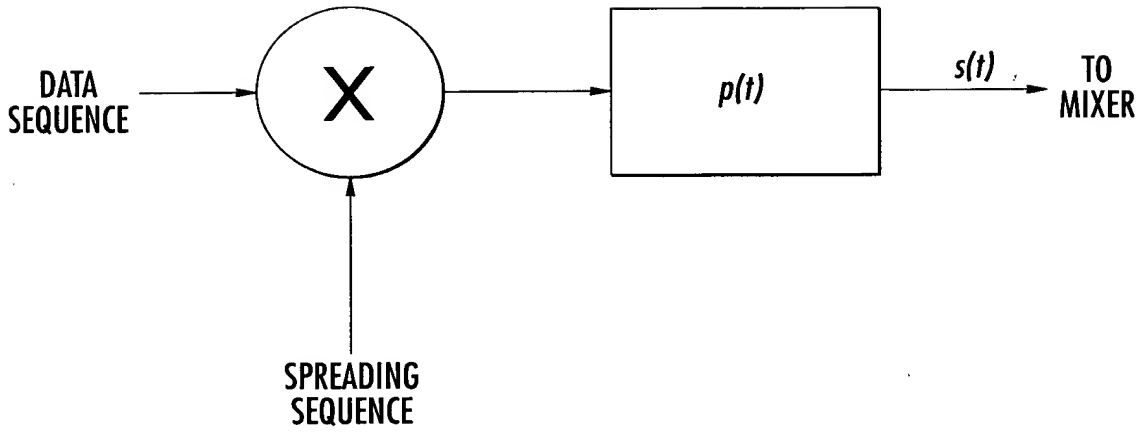

FIG. 1.
(PRIOR ART)

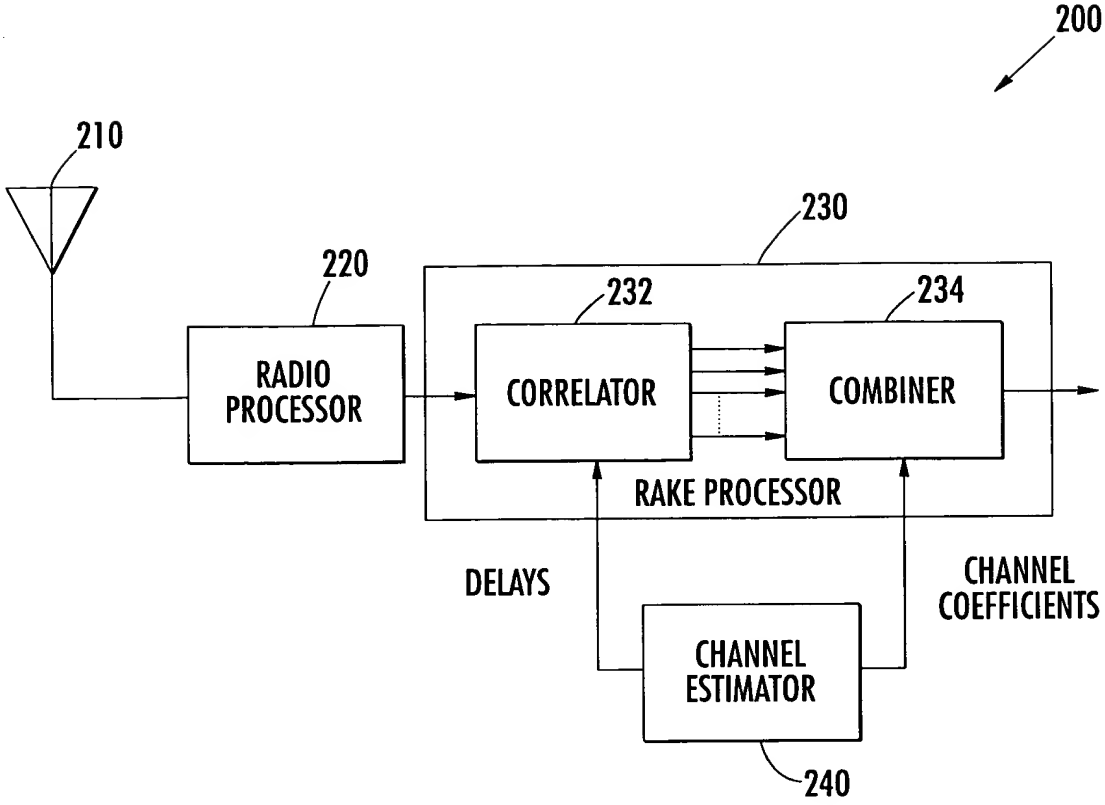

FIG. 2.
(PRIOR ART)

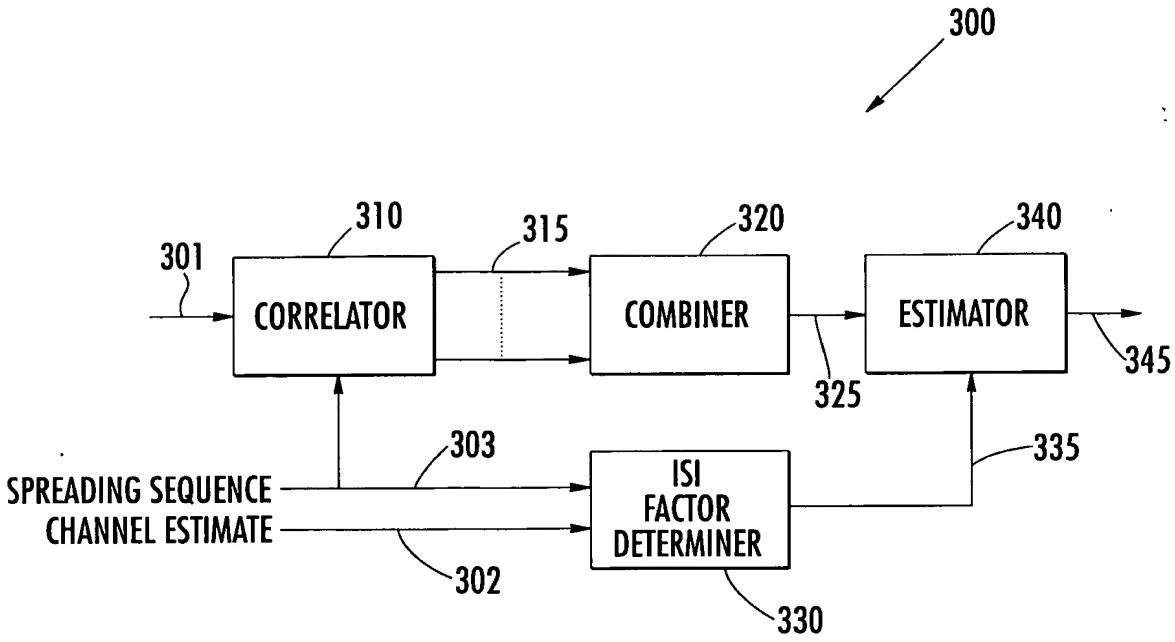
300
310
315
320
340
301
CORRELATOR
COMBINER
ESTIMATOR
345
325
303
335
SPREADING SEQUENCE
CHANNEL ESTIMATE
ISI
FACTOR
DETERMINER
302
330

FIG. 3.

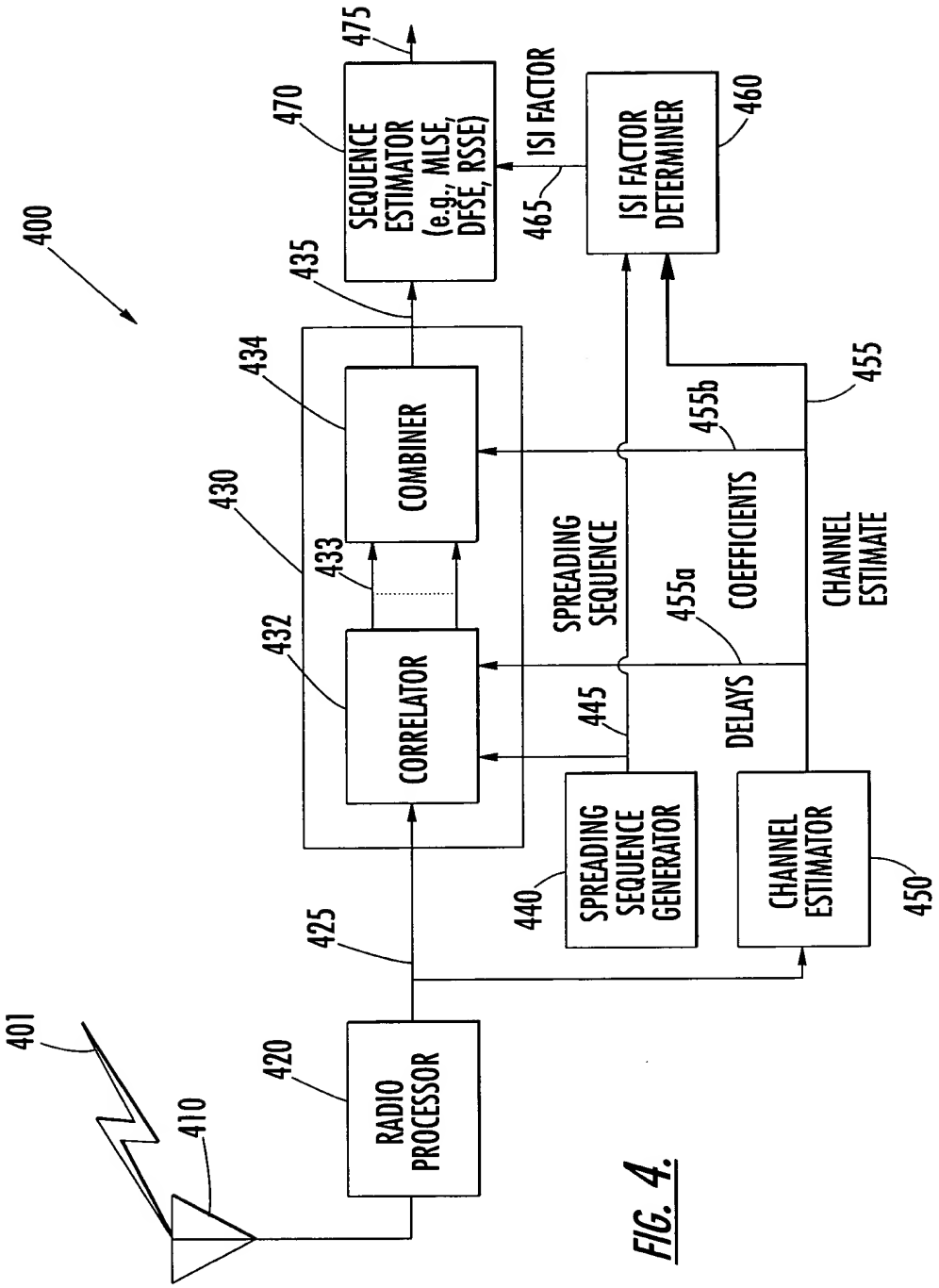
400
401
410
420
RADIO PROCESSOR
425
CORRELATOR
432
430
433
COMBINER
434
435
SEQUENCE ESTIMATOR (e.g., MLSE, DFSE, RSSE)
470
475
ISI FACTOR
465
ISI FACTOR DETERMINER
460
SPREADING SEQUENCE
445
SPREADING SEQUENCE GENERATOR
440
455a
COEFFICIENTS
455b
DELAYS
CHANNEL ESTIMATE
455
CHANNEL ESTIMATOR
450

FIG. 4.

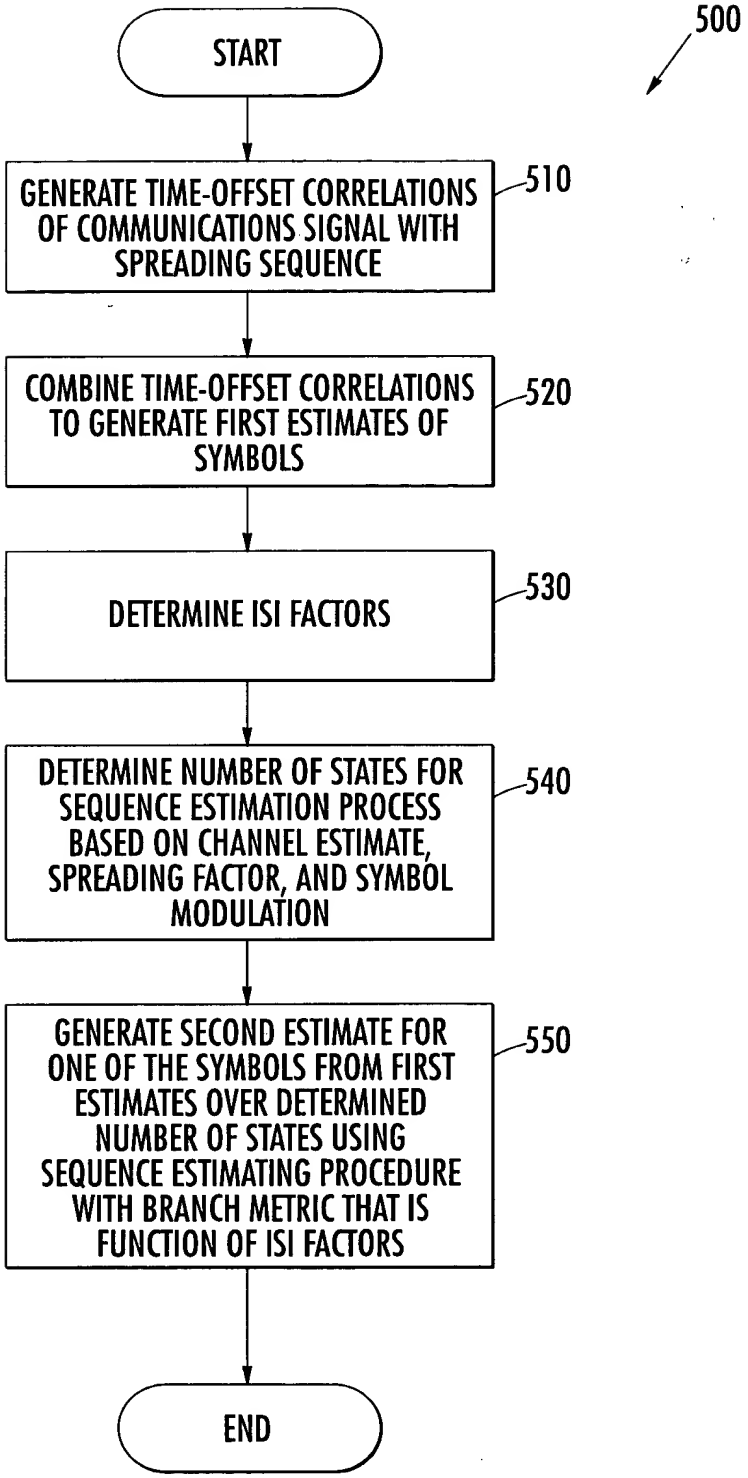
500
START
GENERATE TIME-OFFSET CORRELATIONS OF COMMUNICATIONS SIGNAL WITH SPREADING SEQUENCE
510
COMBINE TIME-OFFSET CORRELATIONS TO GENERATE FIRST ESTIMATES OF SYMBOLS
520
DETERMINE ISI FACTORS
530
DETERMINE NUMBER OF STATES FOR SEQUENCE ESTIMATION PROCESS BASED ON CHANNEL ESTIMATE, SPREADING FACTOR, AND SYMBOL MODULATION
540
GENERATE SECOND ESTIMATE FOR ONE OF THE SYMBOLS FROM FIRST ESTIMATES OVER DETERMINED NUMBER OF STATES USING SEQUENCE ESTIMATING PROCEDURE WITH BRANCH METRIC THAT IS FUNCTION OF ISI FACTORS
550
END

FIG. 5.

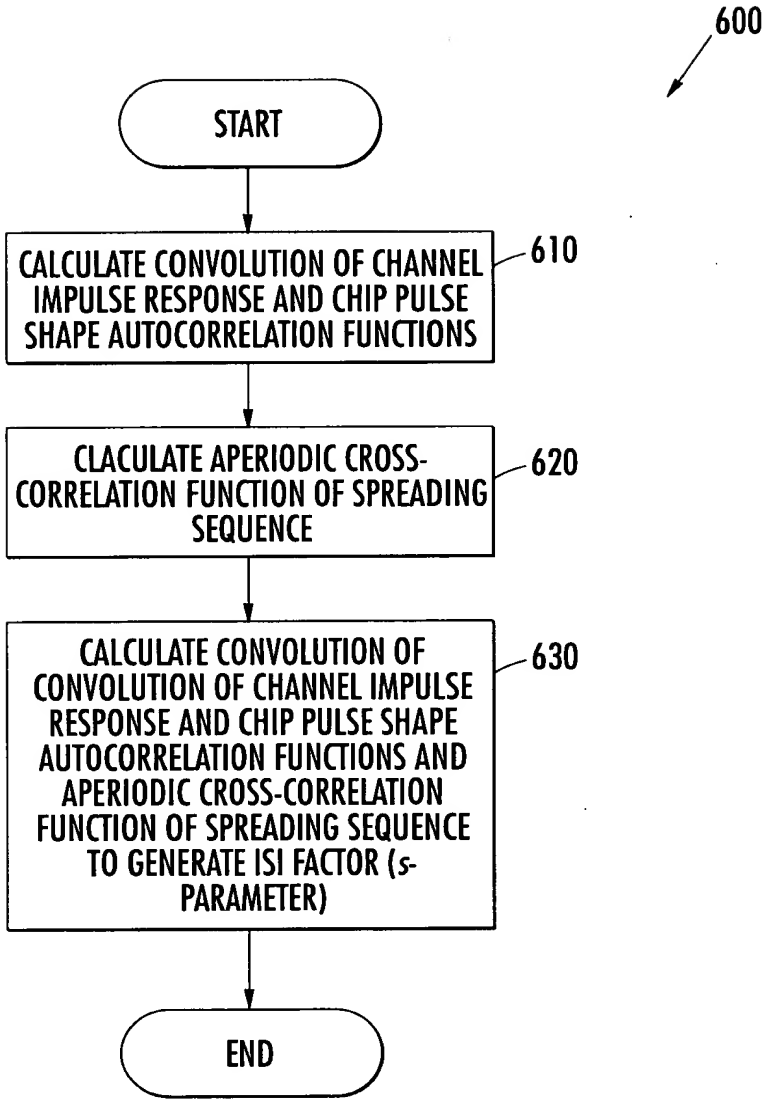
600
START
CALCULATE CONVOLUTION OF CHANNEL IMPULSE RESPONSE AND CHIP PULSE SHAPE AUTOCORRELATION FUNCTIONS
610
CLACULATE APERIODIC CROSS-CORRELATION FUNCTION OF SPREADING SEQUENCE
620
CALCULATE CONVOLUTION OF CONVOLUTION OF CHANNEL IMPULSE RESPONSE AND CHIP PULSE SHAPE AUTOCORRELATION FUNCTIONS AND APERIODIC CROSS-CORRELATION FUNCTION OF SPREADING SEQUENCE TO GENERATE ISI FACTOR (s-PARAMETER)
630
END

FIG. 6.

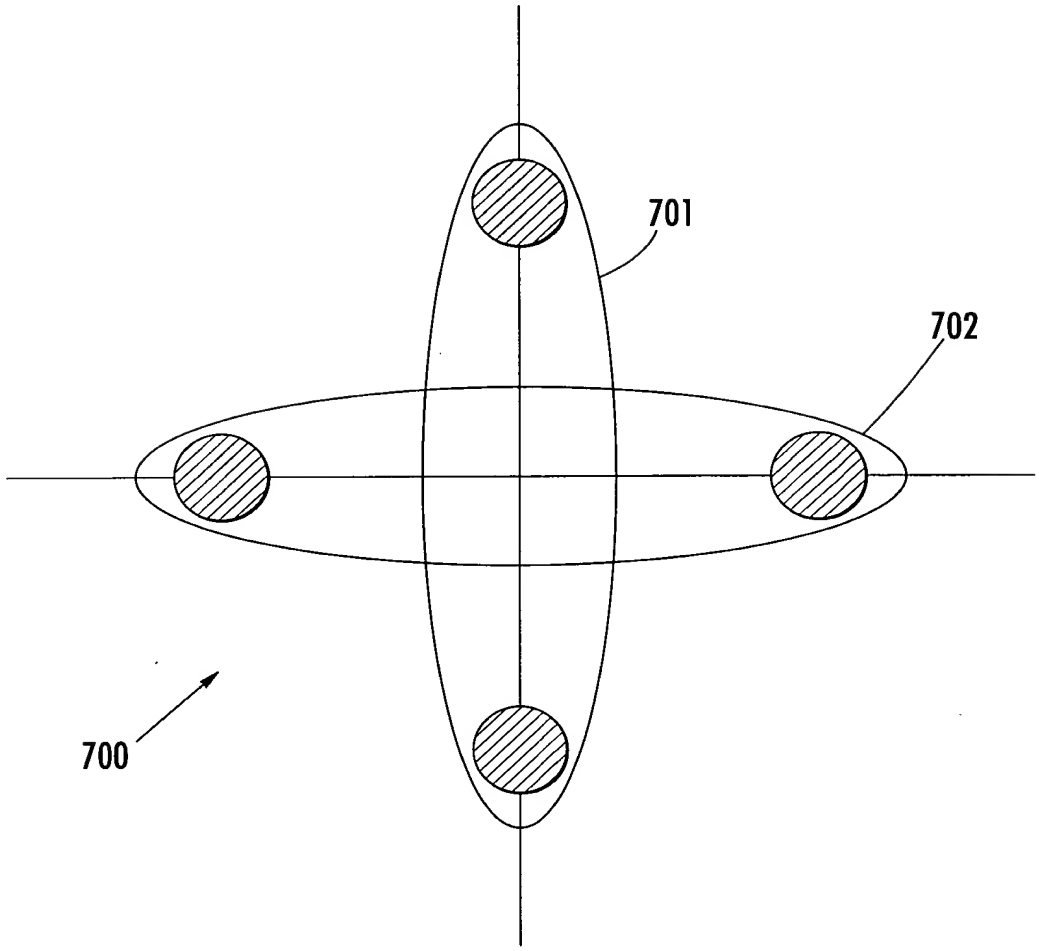

FIG. 7.

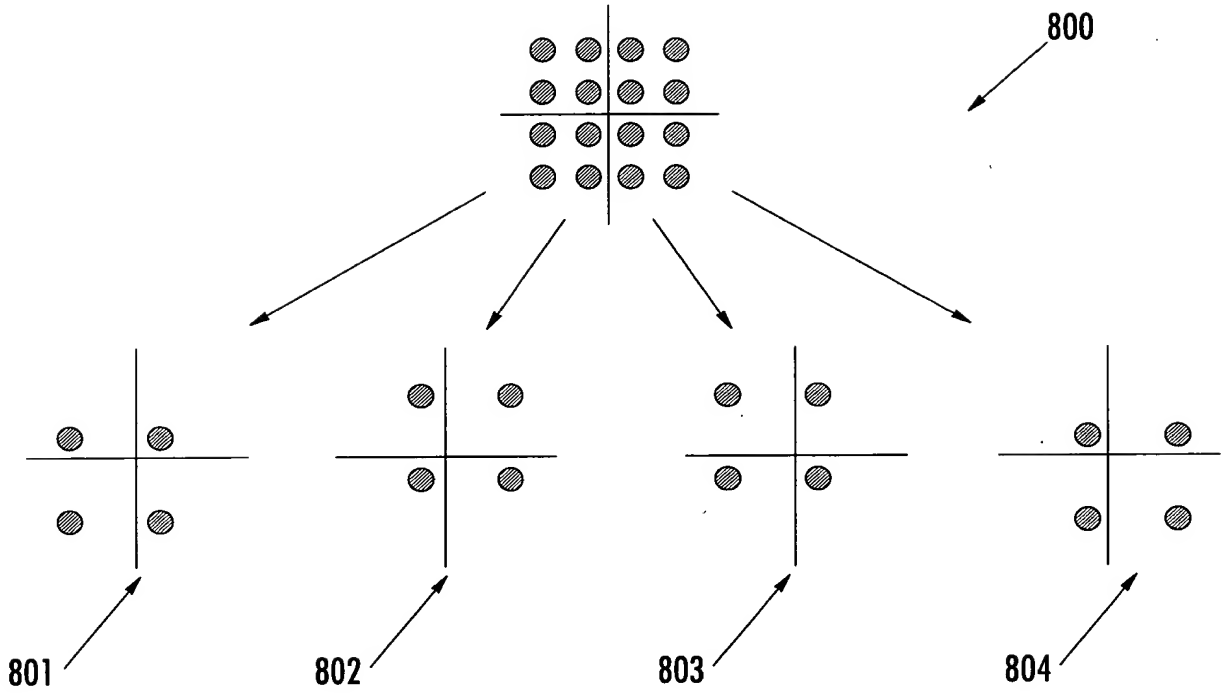

FIG. 8.

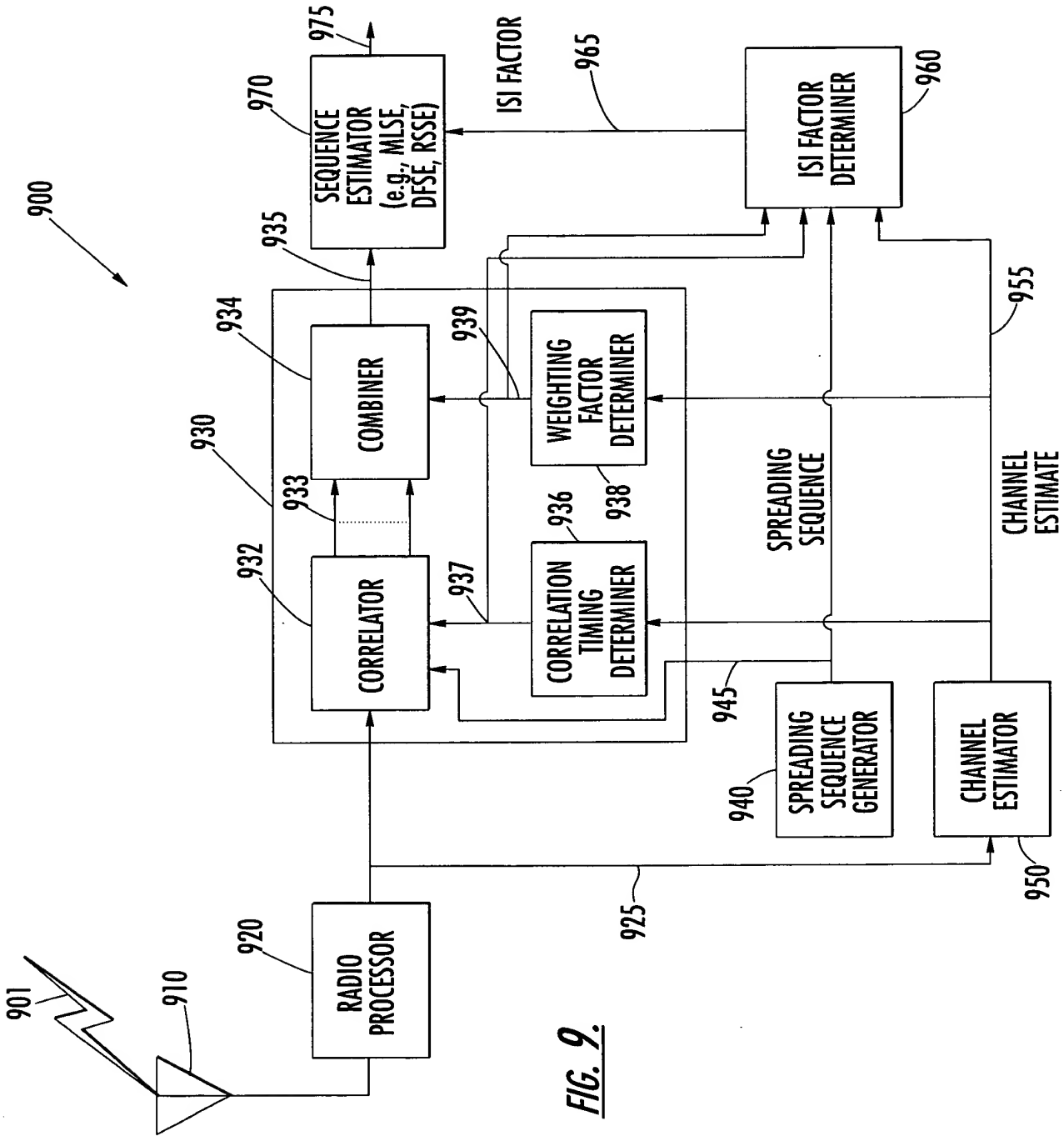
900
901
910
920
RADIO PROCESSOR
925
930
932
933
CORRELATOR
934
COMBINER
935
SEQUENCE ESTIMATOR (e.g., MLSE, DFSE, RSSE)
970
975
ISI FACTOR
965
ISI FACTOR DETERMINER
960
939
WEIGHTING FACTOR DETERMINER
938
936
CORRELATION TIMING DETERMINER
937
945
SPREADING SEQUENCE
940
SPREADING SEQUENCE GENERATOR
CHANNEL ESTIMATE
955
CHANNEL ESTIMATOR
950

FIG. 9.

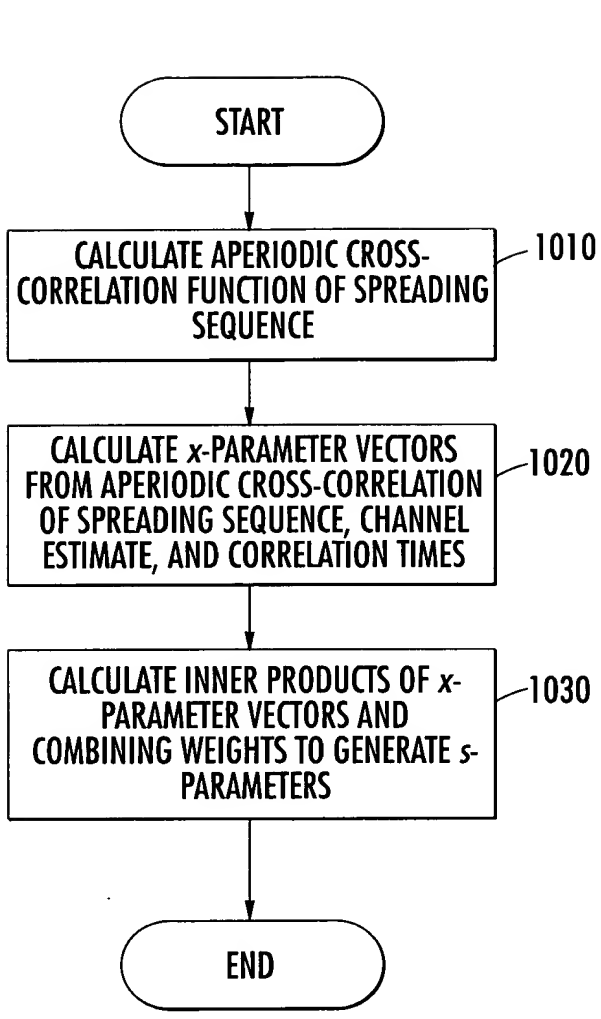
1000
START
CALCULATE APERIODIC CROSS-CORRELATION FUNCTION OF SPREADING SEQUENCE
1010
CALCULATE x-PARAMETER VECTORS FROM APERIODIC CROSS-CORRELATION OF SPREADING SEQUENCE, CHANNEL ESTIMATE, AND CORRELATION TIMES
1020
CALCULATE INNER PRODUCTS OF x-PARAMETER VECTORS AND COMBINING WEIGHTS TO GENERATE s-PARAMETERS
1030
END

FIG. 10.

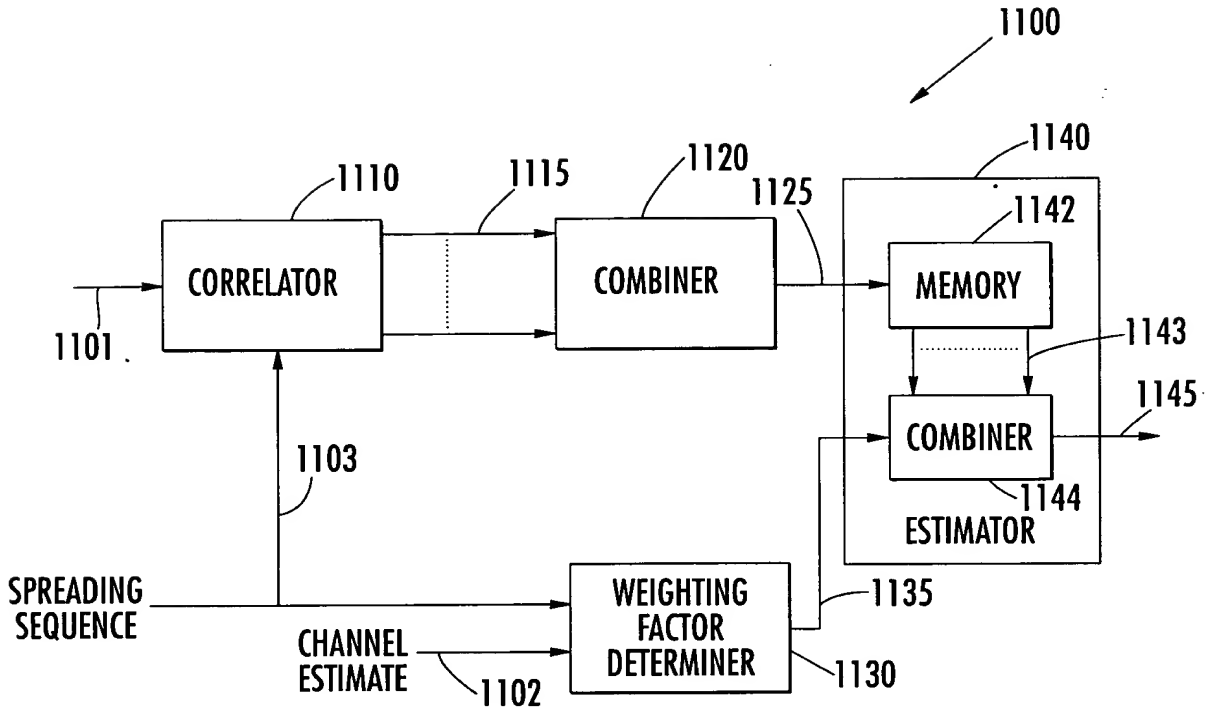
1100
1140
1110
1115
1120
1125
1142
CORRELATOR
COMBINER
MEMORY
1101
1143
1145
COMBINER
1103
1144
ESTIMATOR
SPREADING SEQUENCE
WEIGHTING FACTOR DETERMINER
1135
CHANNEL ESTIMATE
1102
1130

FIG. 11.

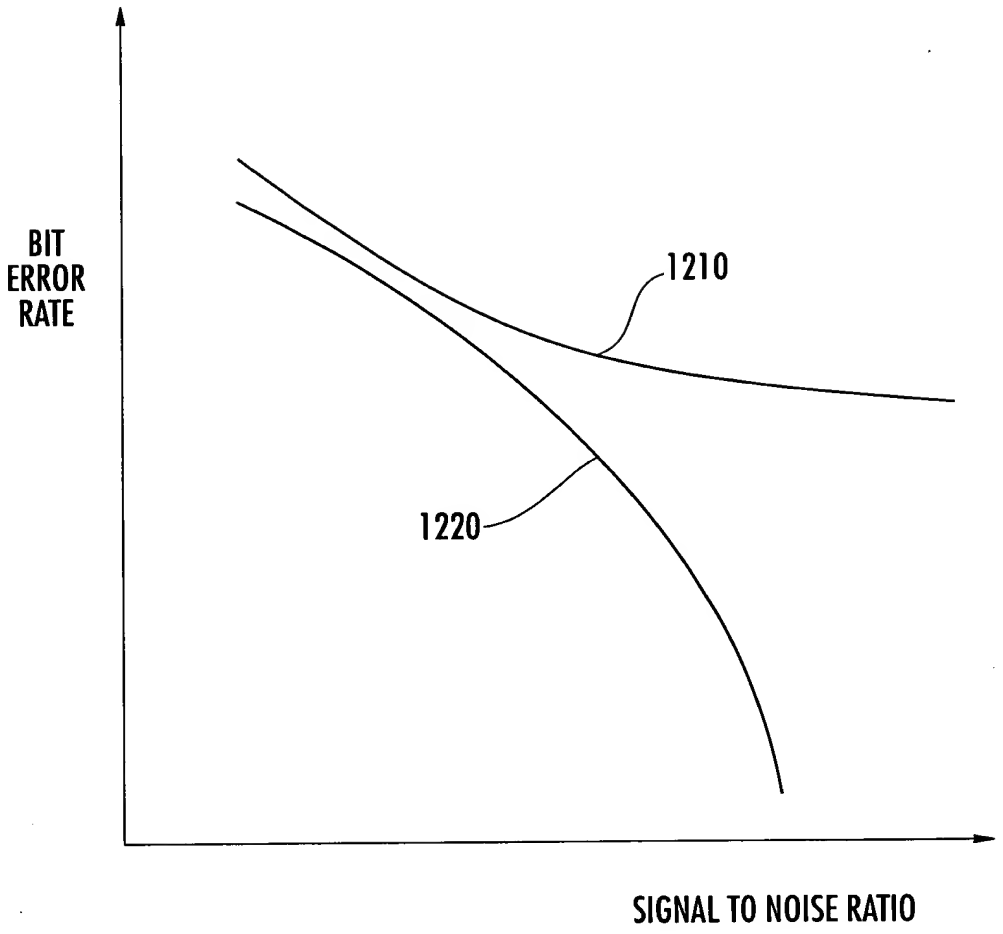

FIG. 12.